



# Febrile Seizures

U.S. DEPARTMENT OF HEALTH  
AND HUMAN SERVICES  
National Institutes of Health



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## What are febrile seizures?

**F**ebrile seizures are seizures or convulsions that occur in young children and are triggered by fever. Young children between the ages of about 6 months and 5 years old are the most likely to experience febrile seizures; this risk peaks during the second year of life. The fever may accompany common childhood illnesses such as a cold, the flu, or an ear infection. In some cases, a child may not have a fever at the time of the seizure but will develop one a few hours later.

The vast majority of febrile seizures are convulsions. Most often during a febrile seizure, a child will lose consciousness and both arms and legs will shake uncontrollably. Less common symptoms include eye rolling, rigid (stiff) limbs, or twitching on only one side or a portion of the body, such as an arm or a leg. Sometimes during a febrile seizure, a child may lose consciousness but will not noticeably shake or move.

Most febrile seizures last only a few minutes and are accompanied by a fever above 101°F (38.3°C). Although they can be frightening for parents, brief febrile seizures (less than 15 minutes) do not cause any long-term health problems. Having a febrile seizure does not mean a child has epilepsy, since that disorder is characterized by reoccurring seizures that are

not triggered by fever. Even prolonged seizures (lasting more than 15 minutes) generally have a good outcome but carry an increased risk of developing epilepsy.

## **How common are febrile seizures?**

**F**ebrile seizures are the most common type of convulsions in infants and young children and occur in 2 to 5 percent of American children before age 5. Approximately 40 percent of children who experience one febrile seizure will have a recurrence. Children at highest risk for recurrence are those who have:

- their first febrile seizure at a young age (younger than 18 months)
- a family history of febrile seizures
- a febrile seizure as the first sign of an illness
- a relatively low temperature that increases with their first febrile seizure.

A prolonged initial febrile seizure does not substantially boost the risk of reoccurring febrile seizures. However, if another does occur, it is more likely to be prolonged.

## **What should be done for a child having a febrile seizure?**

**I**t is important that parents and caretakers remain calm, take first aid measures, and carefully observe the child. If a child is having a febrile seizure, parents and caregivers should do the following:

- Note the start time of the seizure. If the seizure lasts longer than 5 minutes, call an ambulance. The child should be taken

immediately to the nearest medical facility for diagnosis and treatment.

- Call an ambulance if the seizure is less than 5 minutes but the child does not seem to be recovering quickly.
- Gradually place the child on a protected surface such as the floor or ground to prevent accidental injury. Do not restrain or hold a child during a convulsion.
- Position the child on his or her side or stomach to prevent choking. When possible, gently remove any objects from the child's mouth. Nothing should ever be placed in the child's mouth during a convulsion. These objects can obstruct the child's airway and make breathing difficult.
- Seek immediate medical attention if this is the child's first febrile seizure and take the child to the doctor once the seizure has ended to check for the cause of the fever. This is especially urgent if the child shows symptoms of stiff neck, extreme lethargy, or abundant vomiting, which may be signs of meningitis, an infection over the brain surface.

## Are febrile seizures harmful?

**T**he vast majority of febrile seizures are short and do not cause any long-term damage. During a seizure, there is a small chance that the child may be injured by falling or may choke on food or saliva in the mouth. Using proper first aid for seizures can help avoid these hazards.

There is no evidence that short febrile seizures cause brain damage. Large studies have found that even children with prolonged febrile

seizures have normal school achievement and perform as well on intellectual tests as their siblings who do not have seizures. Even when the seizures last a long time, most children recover completely.

Multiple or prolonged seizures are a risk factor for epilepsy but most children who experience febrile seizures do not go on to develop the reoccurring seizures that are characteristic of epilepsy. Some children, including those with cerebral palsy, delayed development, or other neurological abnormalities as well as those with a family history of epilepsy are at increased risk of developing epilepsy whether or not they have febrile seizures. Febrile seizures may be more common in these children but do not contribute much to the overall risk of developing epilepsy.

Children who experience a brief, full body febrile seizure are slightly more likely to develop epilepsy than the general population. Children who have a febrile seizure that lasts longer than 10 minutes; a focal seizure (a seizure that starts on one side of the brain); or seizures that reoccur within 24 hours, have a moderately increased risk (about 10 percent) of developing epilepsy as compared to children who do not have febrile seizures.

Of greatest concern is the small group of children with very prolonged febrile seizures lasting longer than 30 minutes. In these children, the risk of epilepsy is as high as 30 to 40 percent though the condition may not occur for many years. Recent studies suggest that prolonged febrile seizures can injure the hippocampus, a brain structure involved with temporal lobe epilepsy (TLE).

## How are febrile seizures evaluated?

**B**efore diagnosing febrile seizures in infants and children, doctors sometimes perform tests to be sure that the seizures are not caused by an underlying or more serious health condition. For example, meningitis, an infection of the membranes surrounding the brain, can cause both fever and seizures that can look like febrile seizures but are much more serious. If a doctor suspects a child has meningitis a spinal tap may be needed to check for signs of the infection in the cerebrospinal fluid (fluid surrounding the brain and spinal cord). If there has been severe diarrhea or vomiting, dehydration could be responsible for seizures. Also, doctors often perform other tests such as examining the blood and urine to pinpoint the cause of the child's fever.

If the seizure is either very prolonged or is accompanied by a serious infection, or if the child is younger than 6 months of age, the clinician may recommend hospitalization. In most cases, however, a child who has a febrile seizure usually will not need to be hospitalized.

## Can subsequent febrile seizures be prevented?

**E**xperts recommend that children who have experienced a febrile seizure not take any antiseizure medication to prevent future seizures, as the side effects of these daily medications outweigh any benefits. This is especially true since most febrile seizures are brief and harmless.

If a child has a fever, most parents will use fever-lowering drugs such as acetaminophen or ibuprofen to make the child more comfortable.

However, available studies show this does not reduce the risk of having another febrile seizure.

Although the majority of children with febrile seizures do not need medication, children especially prone to febrile seizures may be treated with medication, such as diazepam, when they have a fever. This medication may lower the risk of having another febrile seizure. It is usually well tolerated, although it occasionally can cause drowsiness, a lack of coordination, or hyperactivity. Children vary widely in their susceptibility to such side effects.

A child whose first febrile seizure is a prolonged one does not necessarily have a higher risk of having reoccurring prolonged seizures. But if the child has another seizure, it is likely to be prolonged. Because very long febrile seizures are associated with the potential for injury and an increased risk of developing epilepsy, some doctors may prescribe medication to these children to prevent prolonged seizures. The parents of children who have experienced a long febrile may wish to talk to their doctor about this treatment option.

## **What research is being done on febrile seizures?**

**T**he mission of the National Institute of Neurological Disorders and Stroke (NINDS) is to seek fundamental knowledge about the brain and nervous system and to use that knowledge to reduce the burden of neurological disease. The NINDS is a component of the National Institutes of Health (NIH), the leading supporter of biomedical research in the world.

Researchers are exploring the biological, environmental, and genetic risk factors that might make children susceptible to febrile seizures. They are also working to pinpoint factors that can help predict which children are likely to have reoccurring or prolonged febrile seizures.

Investigators continue to monitor the long-term impact that febrile seizures might have on intelligence, behavior, school achievement, and the development of epilepsy. For example, NINDS-funded scientists are assessing the effects of febrile seizures, especially very prolonged febrile seizures, on brain structures such as the hippocampus, an area of the brain that plays a role in memory and learning. They are also working to determine the impact of these seizures on the development of epilepsy and memory.

Children who have experienced prolonged febrile seizures are more likely to develop a particular type of epilepsy called temporal lobe epilepsy (TLE), which is often difficult to treat. TLE is associated with scarring of the hippocampus and usually presents in adolescents or young adults, some of whom have a history of long febrile seizures as young children. Scientists are trying to identify which children will go on to develop TLE in order to develop better treatments to prevent this condition. Investigators are also trying to develop drugs to prevent the occurrence of brain injury, epilepsy, and memory problems following prolonged febrile seizures.

## Where can I get more information?

Information about NINDS research on febrile seizures and other neurological disorders is available from the Institute's Brain Resources and Information Network (BRAIN) at:

### **BRAIN**

P.O. Box 5801  
Bethesda, MD 20824  
301-496-5751  
800-352-9424  
*www.ninds.nih.gov*

Other sources of information on febrile seizures include:

### **Centers for Disease Control and Prevention (CDC)**

1600 Clifton Road  
Atlanta, GA 30329-4027  
800-232-4636  
*www.cdc.gov*

### **Epilepsy Foundation**

8301 Professional Place East, Suite 200  
Landover, MD 20785-2353  
800-332-1000  
*www.epilepsy.com*

### **Citizens United for Research in Epilepsy (CURE)**

430 W. Erie, Suite 210  
Chicago, IL 60654  
312-225-1801  
*www.CUREepilepsy.org*





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